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(54) Abstract Title
Sterilising bag

(57) A re-usable sterilising vessel 10 comprises a bag 18 formed from flexible plastics sheet material, e.g. polyethylene, nylon and/or polypropylene, having a selectively sealable first opening 19 and a second exhaust opening 21 consisting of a recessed portion (21b, fig. 4) on a peripheral edge (a, fig. 4) of the bag 18 with an aperture (21a, fig. 4) passing from the exterior to the interior of the bag. In use, articles B1, B2, e.g. baby feeding bottles, are placed in the bag with a quantity of water, whereupon the first opening 19 is closed, and the vessel 10 is heated in a microwave for a predetermined period, during which time vapour escapes via the exhaust opening 21. Upon completion of the sterilisation, excess water is discharged via the exhaust opening 21 and the first opening 19 is opened to allow removal of the articles. The first opening 19 may be sealed with, for example, a zip or adhesive patches, and the vessel 10 may have a handle portion (FP, fig. 11). The bag 18 may bear information, e.g. instructions, relating to the bag and/or sterilisation process, and may have means to indicate the number of uses (33, fig. 8) and/or the temperature (not shown) of the bag 18. The vessel 10 may have attachment means 22, e.g a hook, from which it can be hung.

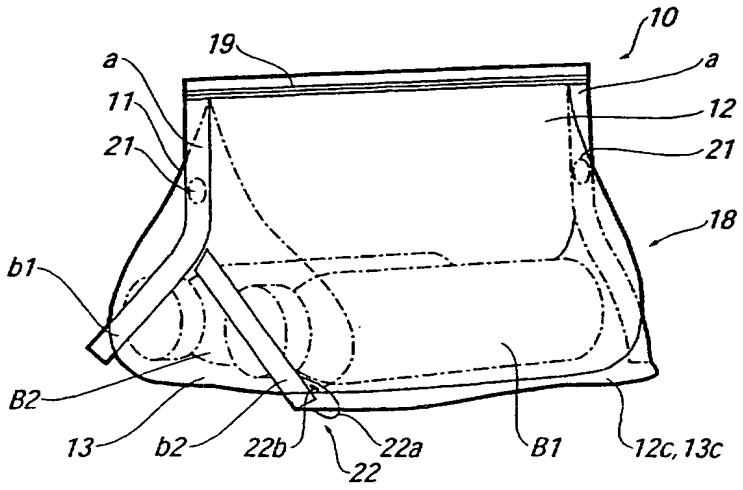

FIG. 1

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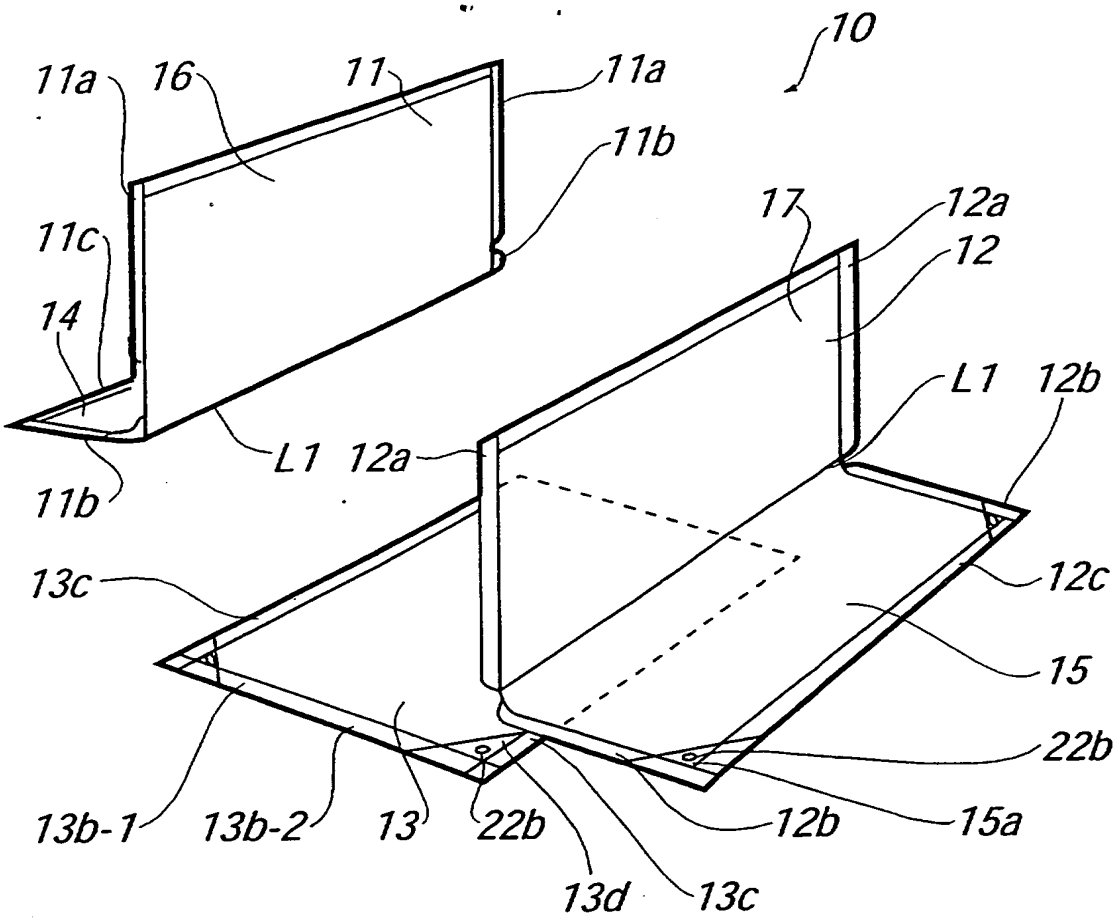

FIG. 1

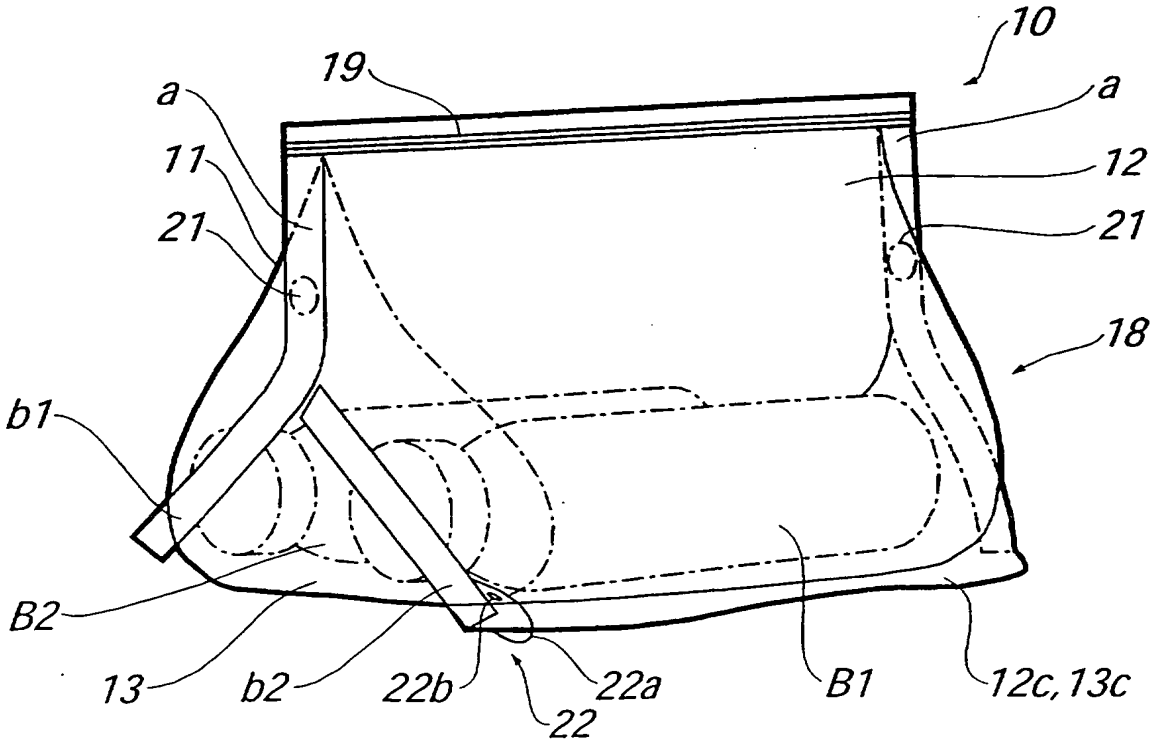

FIG. 1

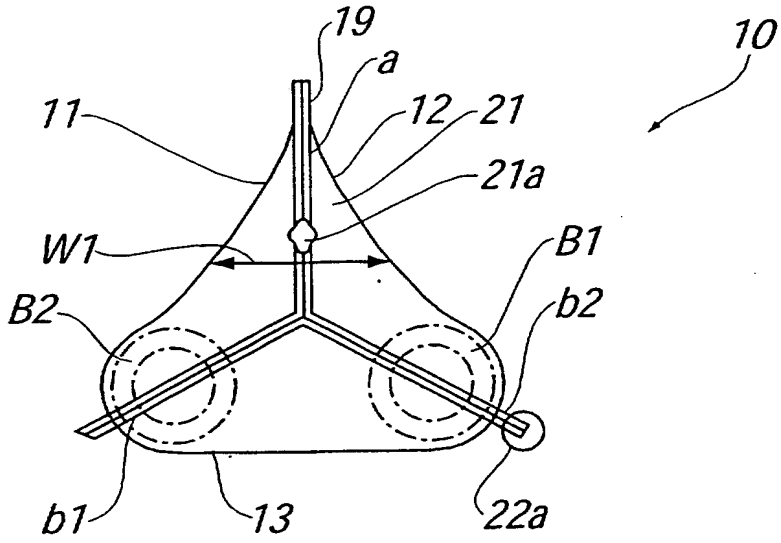

FIG. 3

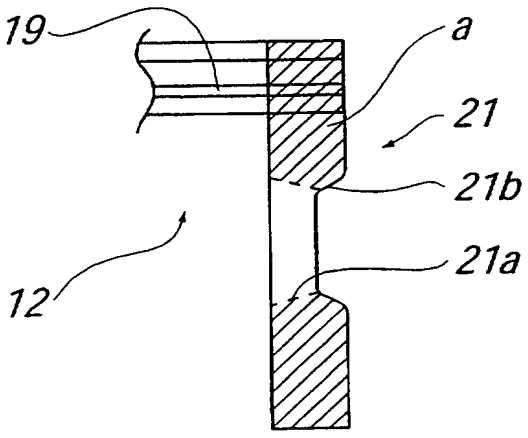

FIG. 4

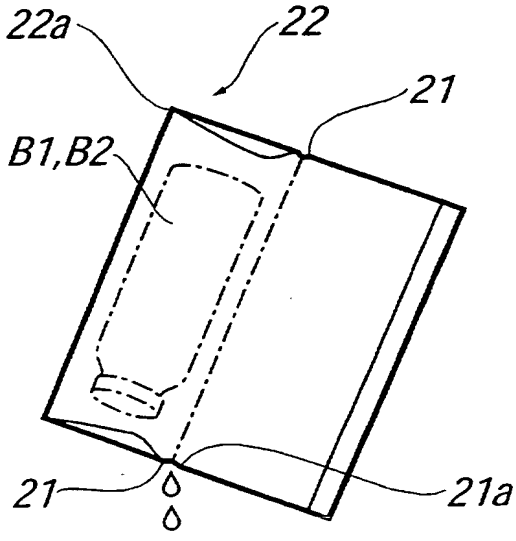

FIG. 5

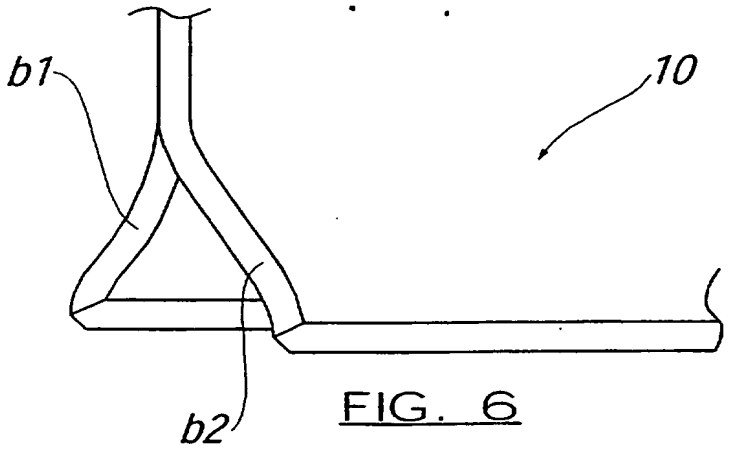

FIG. 6

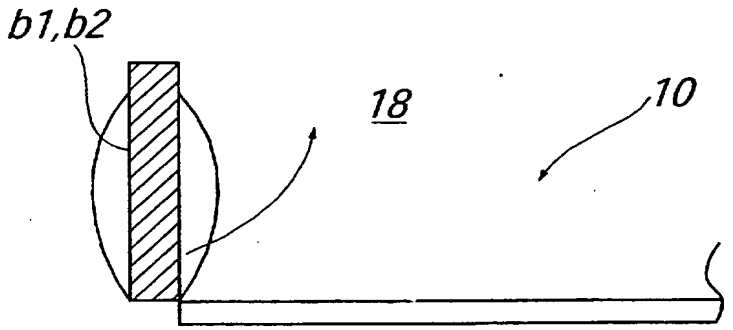

FIG. 7

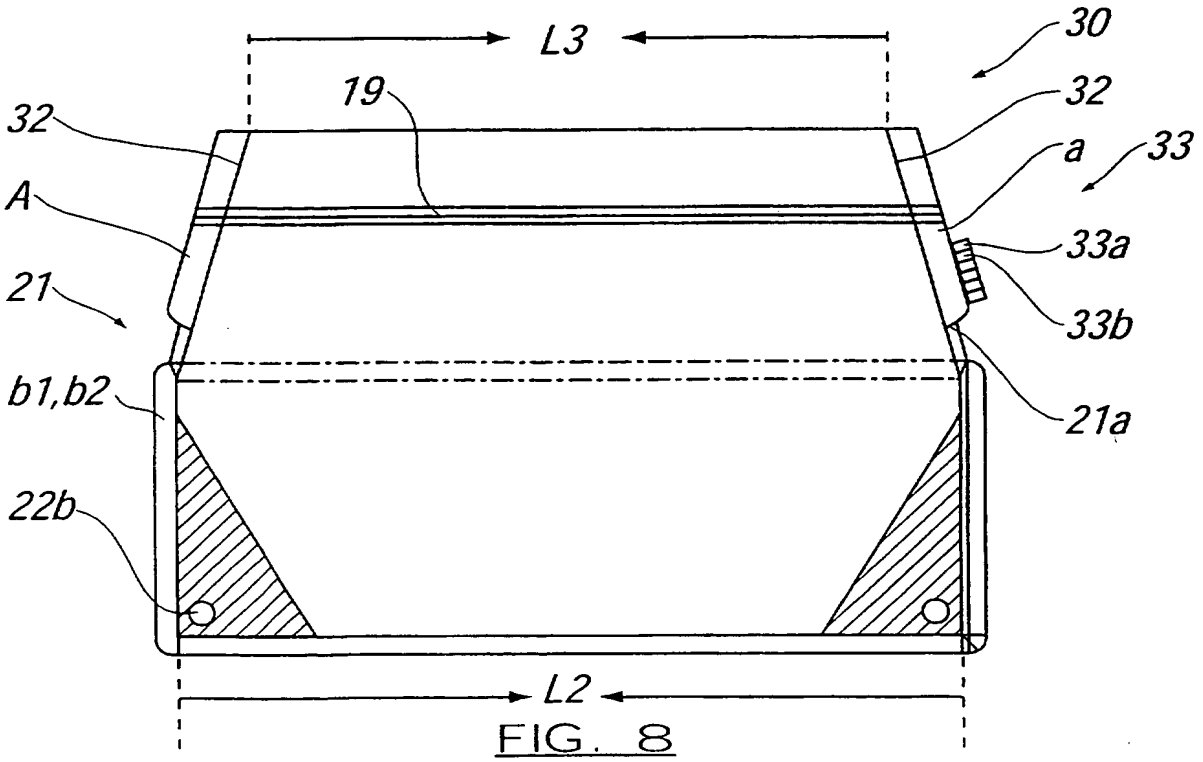

FIG. 8

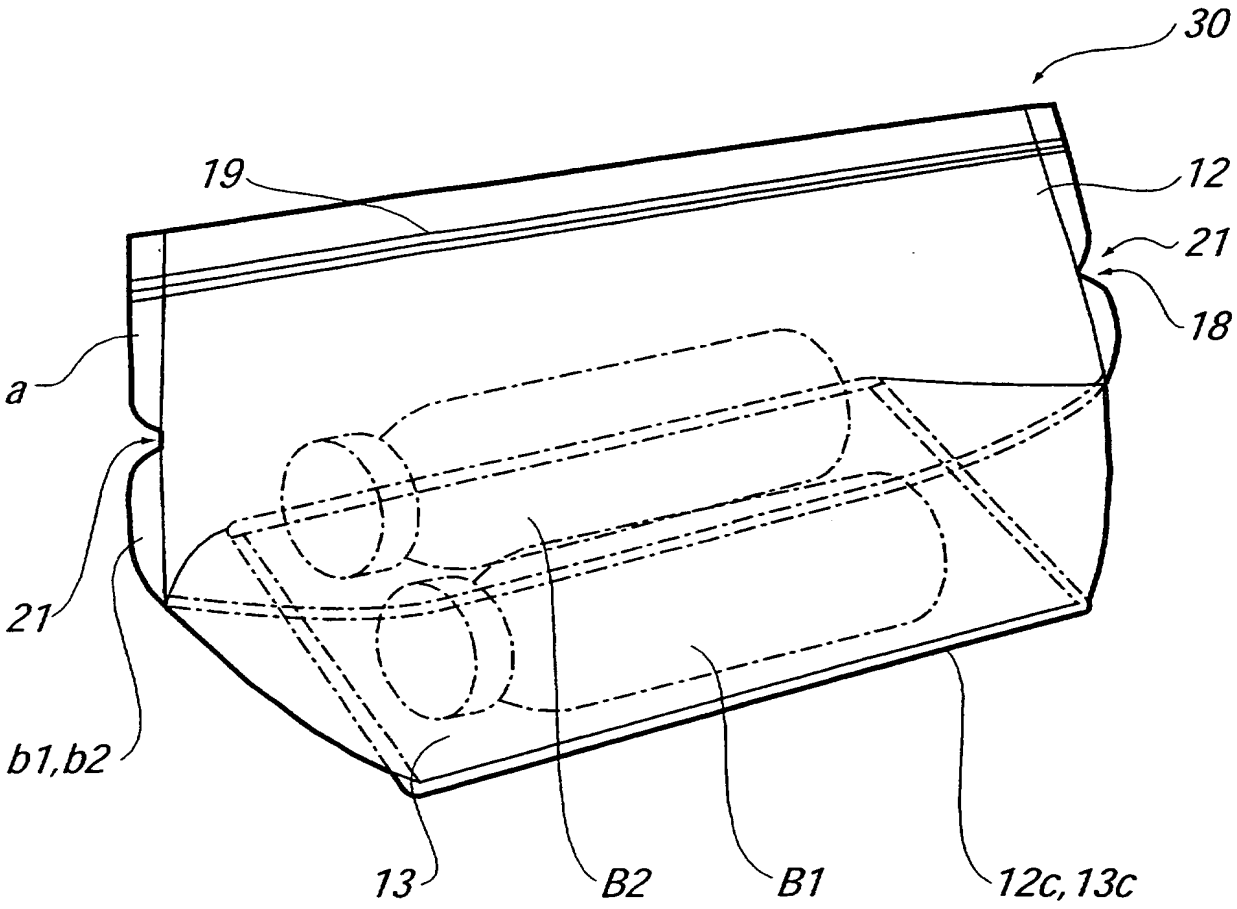

FIG. 9

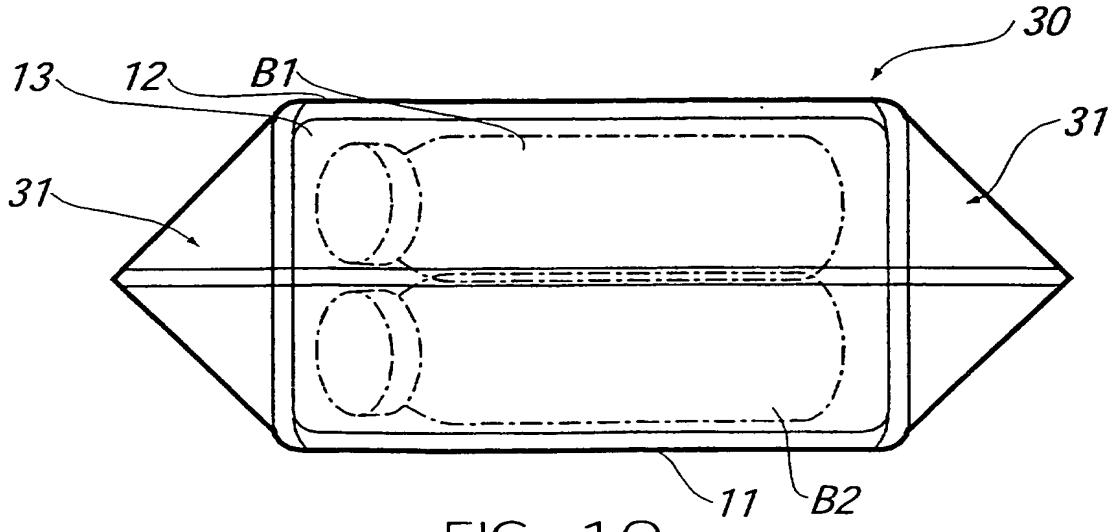

FIG. 10

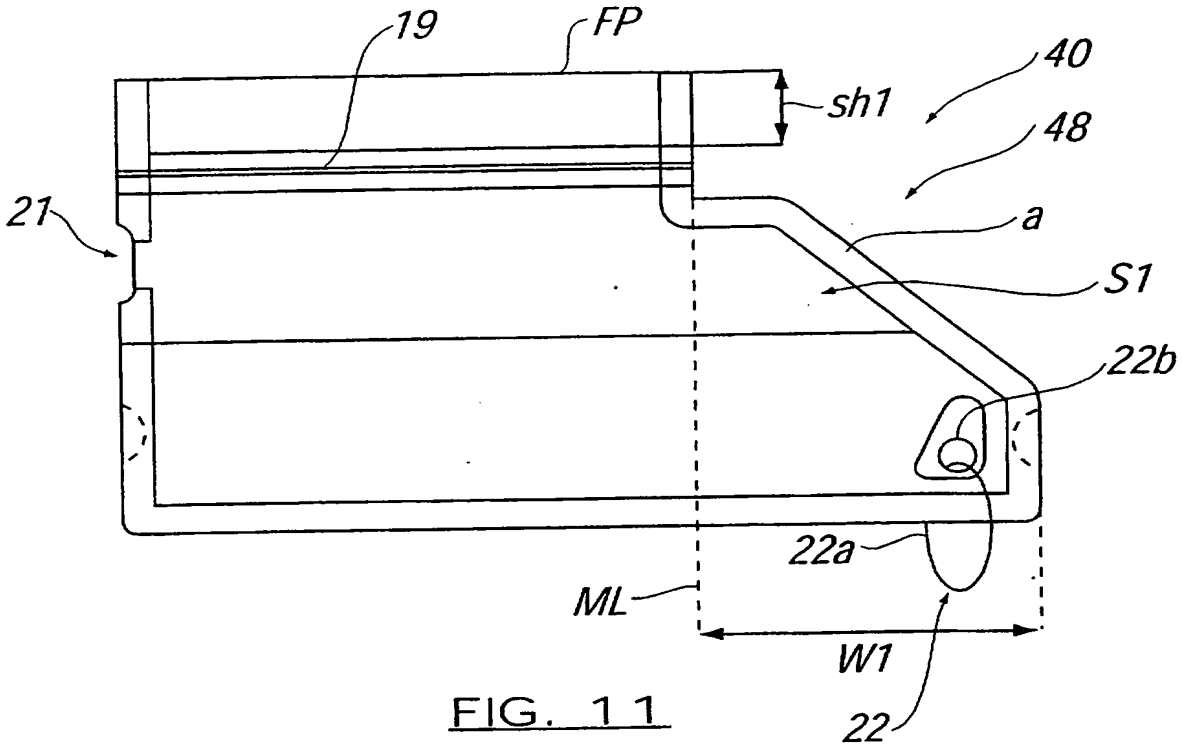

FIG. 11

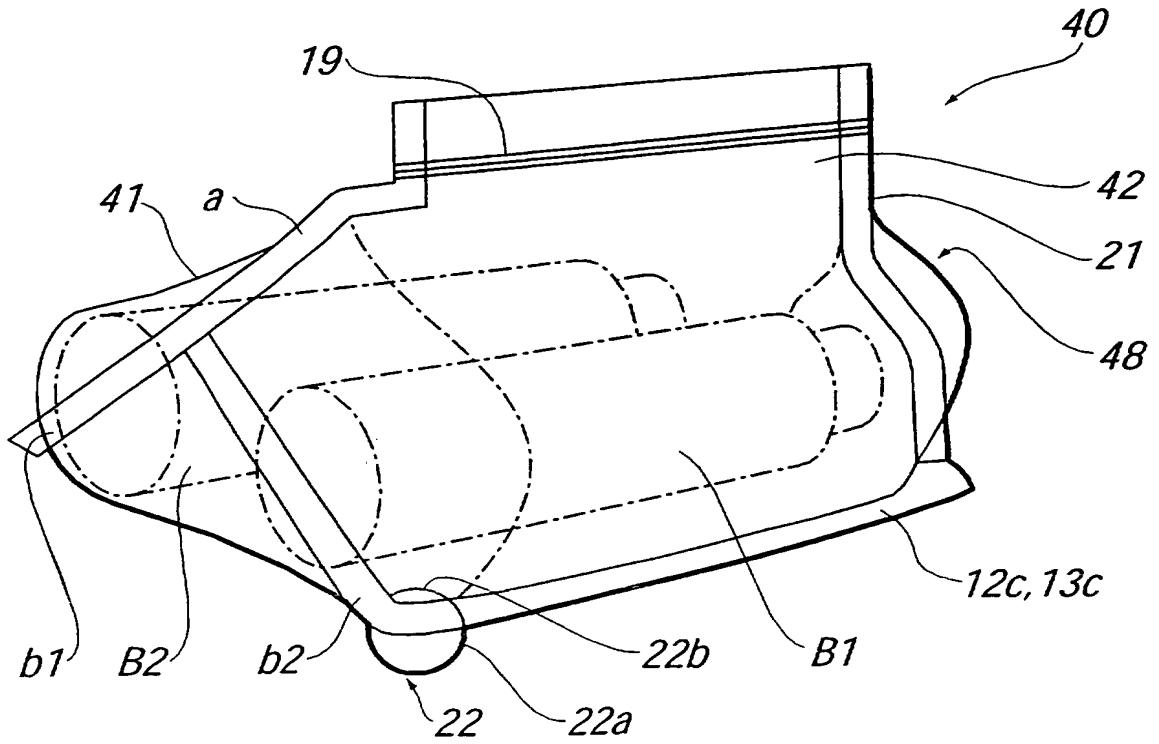

FIG. 12

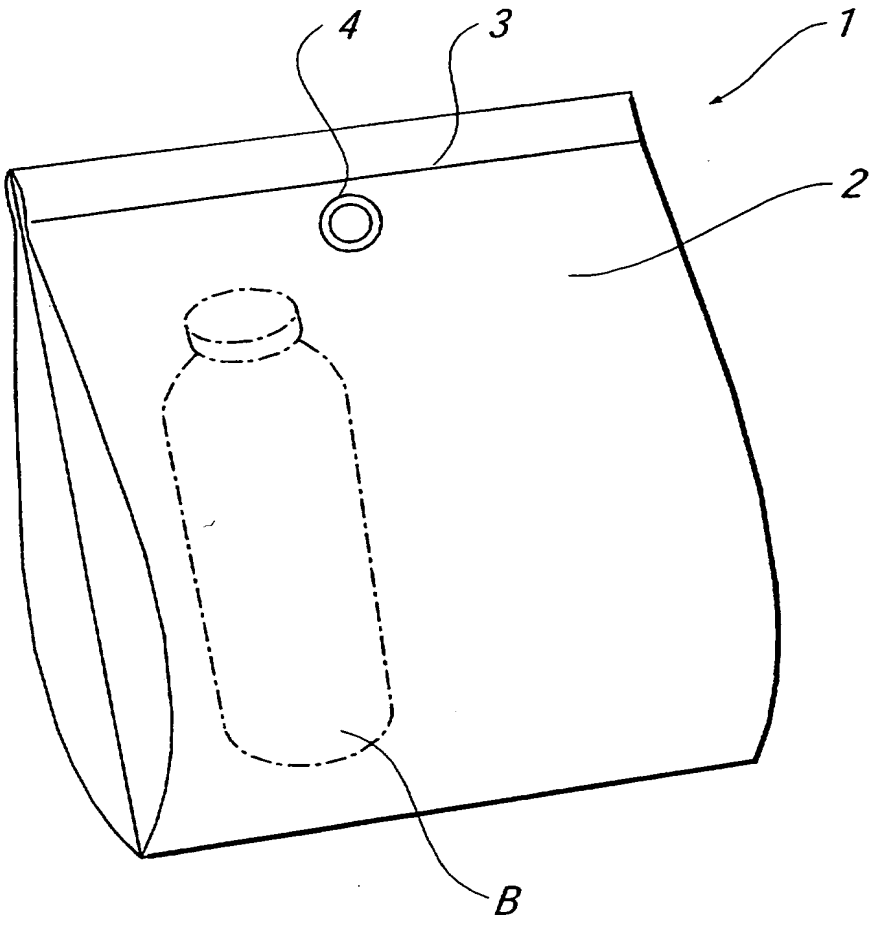

FIG. 13

Steriliser Bag

The invention which is the subject of this application is a bag which allows for the sterilisation of articles and particularly, but not exclusively, the sterilisation of articles in the form of baby feeding apparatus.

Conventionally, sterilising apparatus is provided for babies' parents to allow the babies feeding articles to be sterilised prior to use, thus reducing or preventing the risk of babies picking up infection from the feeding apparatus.

Sterilisation of the feeding articles can be achieved, in one form, by placing the articles in a bowl of water and then placing sterilising tablets into the same. However, this can leave the articles tasting of chemicals and can be unpleasant for the baby. An alternative method is to provide a vessel in which the articles are placed and steam is created to sterilise the articles.

The aim of the present invention is to provide improved sterilising apparatus which allows for the sterilising of articles using a microwave apparatus.

In a first aspect of the invention there is provided a sterilising bag, said bag formed from flexible sheet material and wherein said bag has a first opening which is selectively sealable and through which an article or articles to be sterilised are placed into the bag, and at least a second exhaust opening which remains open during the sterilisation process.

In one embodiment, prior to the sterilising process, a quantity of water is placed into the bag along with the article or articles to be sterilised, whereupon the first opening is sealed. The sterilising

process is performed by placing the bag containing the articles in a microwave on a heat operation for a pre-determined period of time.

Preferably, once the sterilisation process is complete water is discharged from the bag via the second exhaust opening/vent and the first opening is then opened to allow the removal of the article(s).

The first opening can be sealed and resealed by using a zip formation, adhesive patches and/or the like.

In a preferred embodiment the bag includes a portion which is upstanding when the bag is in use and allows the bag to be gripped without the user burning their hands after the microwave use.

Preferably the bag is made of material which allows the bag to be reused on a number of occasions.

Further preferably the bag is formed with printed matter thereon and includes any or any combination of, instructions, a means of indicating the number of occasions of use of the bag, the manner in which the articles should be placed in the bag and/or means indicating various features of the bag.

Preferably the bag is formed from first, second and third sheets of material comprising a base portion, and first and second side walls, joined together along the respective peripheral edges by heat sealing.

A method of using a sterilising bag, said bag formed from flexible material, said method including the steps of placing an article or articles to be sterilised into the bag through a first opening which is selectively sealable, placing water into the bag along with the article

or articles, heating the bag for a pre-determined period of time and wherein water and/or water vapour is discharged from the bag via a second exhaust opening.

Specific embodiments of the present invention will be described in detail below, with reference to the attached drawings. The embodiments which will be described below are preferable and specific examples. Thus, technically preferable various limitations have been added to the examples. However, as long as there are no descriptions that particularly limit the present invention in the following explanations, the scope of the present invention is not limited to these embodiments; wherein

Fig. 1 is an exploded perspective view showing a structure of a first embodiment of a sterilising vessel according to the present invention;

Fig. 2 is a schematic perspective view of the sterilising vessel in Fig. 1;

Fig. 3 is a schematic side view of the sterilising vessel in Fig. 1;

Fig. 4 is an explanatory view showing a structure of internal pressure control means of the sterilising vessel in Fig. 1;

Fig. 5 is an explanatory view showing one example of a use state for the sterilising vessel in Fig. 1;

Fig. 6 is an explanatory view of a configuration of a sterilising vessel according to a second embodiment of the present invention;

Fig. 7 is an explanatory view of a configuration of a sterilising vessel according to the second embodiment of the present invention;

Fig. 8 is a schematic front view of a sterilising vessel according to the second embodiment of the present invention;

Fig. 9 is a schematic perspective view of the sterilising vessel in Fig. 8;

Fig. 10 is a schematic bottom view of the sterilising vessel in Fig. 8;

Fig. 11 is a schematic front view of a sterilising vessel according to a third embodiment of the present invention;

Fig. 12 is a schematic perspective view of the sterilising vessel in Fig. 11;

Fig. 13 is a perspective view showing one example of a conventional sterilising vessel.

Referring firstly to Fig.13, there is illustrated a conventional sterilising vessel 1 comprising a bag 2 formed from sheet material. The bag 2 has a first opening 3 via which a bottle B can be located in the bag 2 and removed therefrom. The bag containing the bottle can then undergo a sterilisation process to sterilise the bottle therein.

Referring to Fig. 1, there is shown an exploded perspective view of a sterilising vessel according to a first embodiment of the present invention.

The sterilising vessel 10, which is referred to hereinafter as vessel 10, forms a bag body by securing the side edge portions of three sheet bodies 11, 12 and 13 to each other. These sheet bodies can be made from, for example, a synthetic resin material having a soft material property which does not melt when placed in a microwave oven at high temperatures for a prolonged period of time. Such material can include nylon, polyethylene terephthalate (PET), polypropylene and/or the like.

In the present embodiment a laminate material is used and comprises an outer layer of PET of approximately 12 micron in thickness and an inner layer of CPP (polypropylene) of approximately 50 micron in thickness.

The first sheet body 11 and second sheet body 12 have approximately the same shape. The size of the sheet body is determined by the size of the object or objects to be sterilised. For example, if the sheet body is configured for sterilising mainly a commercially available babies bottle, the dimensions of the sheet are approx. 155 mm depth by 270 mm width. Thus the sheet body is of such as size to form a bag for containing a comparatively long object to be sterilised, such as a baby bottle or the like, the object being accommodated sideways in the lower portion of the bag, as described below. Fixing margins 11a, 11b and 12a, 12b, each of approximately 10mm wide are provided on side edge portions of the first and second sheet bodies 11 and 12 respectively. The margins 11a and 11b, and the margins 12a and 12b respectively correspond to the upper and lower portions of each sheet. The sheet bodies 11 and 12 also provide fixing margins 11c and 12c, along the lower edges, respectively.

The third sheet body 13 is formed from the same material of the first and second sheet bodies 11 and 12, and has dimensions, for

example, 140 mm long by 270 mm wide in accordance with the dimensions of sheet bodies 11 and 12. The third sheet body 13 has fixing margins 13b-1, 13b-2, 13c along the edges thereof. Fixing margins 13b-1 and 13b-2 are formed on both sides of sheet 13 but one side is omitted for clarity of the illustration.

The first and second sheet bodies 11 and 12, are folded along fold lines L1, obtained by connecting the vicinities of the boundaries between the fixing margins 11a and 11b, and between the fixing margins 12a and 12b, thereby forming standing portions 16 and 17, and folded portions 14 and 15, respectively. The fixing margins 13b-1, 13b-2 and 13c of third sheet body are secured to fixing margins 11b, 11c and 12b and 12c of folded portions 14 and 15, using a heat seal method and/or the like.

Specifically, the fixing margin 13b-1 of the third sheet body 13 is fixed to the fixing margin 11b of the first sheet body 14, and the fixing margin 13b-2 of the third sheet body 13 is fixed to the fixing margin 12b of the second sheet body 15. In addition, when the fixing margin 13b-1 of the third sheet body 13 is fixed to the fixing margin 11b of the first sheet body 14, the corner portion 13d is also fixed to the corner portion 15a when overlapped. The other corner portions of the third sheet 13 are fixed to the respective corner portions of the first sheet body 11 and second sheet body 12. Thus, a top edge-opened bag 18 is obtained, as shown in Fig. 2.

Referring to Fig. 2, the bag 18 is formed by fixing the margins of the respective edge portions of the first, second and third sheet bodies 11, 12 and 13 to each other as described above. The third sheet body 13 forms the base of the bag and the first and second sheet bodies 11 and 12 form the front and back portions of the bag 18.

When bottles B1 and B2, such as baby bottles or the like, are accommodated in bag 18, as shown in Fig. 2, the third sheet body 13 forms, in addition to the base, part of the sides of the bag, the fixing margins 13b-1 and 13b-2 being raised to the vicinity of the centre level of the side of the bag 18, as shown in Figs. 2 and 3

In figures 2 and 3, referring to the sides of the bag 18, edge portion 'a' comprises joined fixing margins 11a and 12a, edge portion 'b' comprises joined margins 11b and 13b-1, and edge portion 'b2' comprises joined margins 12b and 13b-2.

Thus, the bag 18 has a base of width approx. equal to the width of third sheet body 13, and a length marginally shorter than the length of the sheet body 13, when accommodating bottles B1 and B2 therein. Accordingly the bag body 18 is able to be freestanding. Furthermore, the bag 18 has a wide internal space S which accommodates the bottles B1 and B2. This accommodating portion S corresponds to the lower portions of the first and second sheet bodies 11 and 12, and an open/close portion 19 is provided at a position higher than the portion S by a desired distance. As mentioned above, the sheet bodies 11 and 12 have for example a length of about 155 mm, and the lower portions thereof correspond to the accommodating portion S of the bag body 18. The open/close portion 19 is formed adjacent the top edges of the sheet bodies 11 and 12. Therefore, the distance between the accommodating portion S and the open/close portion 19 is fairly large.

The open/close portion 19 is formed with for example a zipper type fastener formed by a combination of a convex straight thread provided on the inner surface of the one of the sheet bodies 11 and 12 and a groove provided in the inner surface of the other facing the former inner surface, said convex straight thread being tightly

fitted into the groove. This fastener 19 may be integrally formed in the inner surfaces of the sheet bodies 11 and 12, or may be formed by attaching a fastener member to the inner surfaces of the sheet bodies 11 and 12. Thus, an open/close portion which can be upwardly opened can be provided in the vicinity of the top edge of the sterilising vessel 10.

Further, as shown in Fig. 2, two internal pressure control means or exhaust vents 21 are provided on both sides edge 'a' of bag 18. The internal pressure control means 21 penetrates through each of the fixing margins of edge portions 'a' of sheet bodies 11 and 12, at a position slightly below the open/close portion 19, as shown in Fig. 4. Specifically, the internal pressure control means 21 includes a cutout or recessed portion 21b where the edge portion 'a' is cut so as to narrow inwardly from the external edge of the bag, and an aperture 21a opening inwardly from the cutout 21b into the interior of the bag 18. The regions of edge portion 'a' shown by the slanted lines are adhered. The aperture 21a passes from the exterior of the bag to the accommodating portion S such that the diameter of the aperture 21a gradually increases towards the interior side.

Thus, since the cutout portion 21b is provided diagonally inwardly, when an undue force acts on the bag 18, the stress concentrated in the area around the boundary between the cutout portion 21b and aperture 21a is reduced and a tear in this portion of the bag can be effectively prevented. In addition, since the apertures 21a are provided on overlapped edge portions of the two sheet bodies, the apertures are closed when the internal bag pressure is low, for example, at room temperature and pressure. When the internal pressure in the bag is increased, for example, during heating of the bag, the apertures 21a are opened, thereby providing a valve effect. When the sheet bodies 12 and 13 on the rear side spread outwardly, the vicinity of the inside boundary of the edge portion tends to

close as shown in Fig. 4. In this case, the above-mentioned aperture 21a extends conically inside the edge portion 'a' and does not fold at the inner boundary of the edge portion. As such, the aperture 21a is not closed. As explained above, the internal pressure control means 21 has the function that when the internal pressure of the bag 18 is low, the internal pressure control means 21 is closed, and when the internal pressure of the bag 18 is increased, the internal pressure control means 21 is opened to discharge vapour. When the bag 18 is inflated with an accommodated object, the aperture 21a is not closed.

An attachment or locking portion 22 is provided on the corner of the bottom portion 13, as shown in Fig. 2. This locking portion 22 is formed by overlapping the holes 22b on folded portion 15 of the second sheet body 12 and on the corner of the third sheet body 13, and inserting a locking ring 22a into the hole 22b.

The sterilising vessel 10 according to the first embodiment of the present invention is formed as described above. A method of the use of the vessel 10, and actions thereof will now be described. Referring to Fig. 2, when the open/close portion 19 of the sterilising vessel 10 is opened, the bottles B1 and B2 are accommodated sideways in the lower portion of the bag 18, as shown, and at the same time, an artificial teat (not shown) or the like is inserted thereinto. During this loading process a force is exerted on the third sheet body 13 in the longitudinal direction of the bottles B1 and B2, such that the third sheet body 13 expands around the outer sides of the bottles B1 and B2. Thus, the lower portion of bag 18 is widened and forms a state where it stands freely with the open/close portion 19 being disposed at the top. In this position, water of for example about 70cc is poured into the accommodating portion S of the bag 18 and the open/close portion 19 is closed.

The bag 18 is placed in the microwave oven in the form shown in fig. 2 for heating, for example, for about three minutes. Thus, each of the bottles B1 and B2 is heat-sterilised by microwaves from the microwave oven. The microwave treatment generates water vapour by boiling the water in the bag and each of the bottles B1 and B2 are sterilised at high temperature. In this embodiment, the generation of vapour and heated air in the accommodation portion S rises during microwave treatment and are discharged through the apertures 21a of the internal pressure control means into the environment. Therefore, the bag 18 is prevented from breaking when there is an extreme increase in the internal bag pressure.

When the microwave oven comes to a stop, a user removes the bag 18 by grasping the area around the top end of the bag 18. The area around the open/close portion 19 is placed at a position higher than the accommodating portion S, and the hot water generating vapour is in the lower portion of the accommodating portion S, together with bottles B1 and B2. Thus, since no high temperature water is in the area at the top end of the bag 18, this area does not exhibit an abnormal high temperature due to the heated water and a user is unlikely to burn themselves whilst handling the bag 18.

Further, when the sterilising vessel 10 is removed from the microwave oven, some vapour still remains within the vessel 10. However, this high temperature vapour is discharged through the apertures 21a on the sides and no high temperature vapour is blown to the area around the top end of the bag 18. Thus the handler of the bag is safe from being burnt.

If the bottles B1 and B2 are immediately used, the open/close portion 19 is opened carefully to allow removal of the bottles B1 and B2. Alternatively, the portion 19 is opened and the bottles B1

and B2 are allowed to cool before being removed. As explained above, in the sterilising vessel 10 of the present embodiment, as compared to the prior art, the risk of the handler of the bag suffering burns is greatly reduced when the vessel 10 is removed from the microwave oven. Thus the vessel 10 is significantly safer for rapid sterilisation than the prior art.

When the above-mentioned bottles B1 and B2 are not used immediately, the heated water in the vessel 10 can be discharged into a sink or the like through aperture 21a of the internal pressure control means 21, as shown in Fig. 5. In addition, the locking ring 22a of the locking portion 22 is locked by the use of a hook or the like on a sink. Therefore, if locking is immediately performed after the high temperature water is discharged, the vessel 10 can be easily stored and cleaned in a water-drained state until the time when the bottles B1 and B2 and required for use.

In the formed bag 18 of vessel 10 shown in Figs. 2 and 3, there is a disadvantage that width W1 is slightly decreased in the area of the boundary between the fixing margin 13b-1 and the fixing margin 13b-2. Further, when bottles are accommodated in the accommodating portion S of the bag 18, the lower region of the bag corresponding to the accommodating portion S expands in the width direction, thereby decreasing the length due to the expansion. However, this change does not occur in the vicinity of the open/close portion 19. Thus the top end of vessel 10 has an excess length and, as a result, the vessel 10 is not formed in a compact size. Therefore, a bag 18 can be formed as shown in Fig. 6.

In fig. 6, edge portions b1 and b2 of the sides of the vessel 10 are fixed to each other when overlapped. As shown in Fig.7, when the bag 18 expands in a width direction, the portions b1 and b2 are

diagonally raised to form a gusset portion as shown by an arrow, so that expanding the top end of the bag 18 in the width direction is not restricted.

Figs. 8 to 10 show a sterilising vessel 30 according to a second embodiment. In these Figs., portions denoted by the same reference numerals as those of sterilising vessel 10 of the first embodiment have the same configurations. The main differences between the embodiments are described below. The edge portions b1 and b2 are overlapped and fixed to each other by the methods shown in Figs. 6 and 7. As shown in Fig. 10, triangular portions 31, which are formed when the bag 18 is expanded in a lateral direction by accommodating bottles B1 and B2 in the bag 18, are inwardly folded as gusset portions. As a result, the bottom portion 13 is substantially rectangular, and a shoulder, where the accommodating portion 8 of the bag body 18 becomes wide, due to excess force in the vicinity of the boundaries of the fixing margins 13b-1 and fixing margins 13b-2, is not formed. On the other hand, to form such a wide accommodating portion S, the sideways length L2 of each of the first and second sheet bodies 11 and 12 should be slightly longer than the corresponding portion of the sterilising vessel 10 of the first embodiment, as shown in the front view of Fig. 8. Accordingly, the bag 18 can have a length extended into the inside of gusset portions 31 shown in Fig. 10, which length corresponds to the extended part of the length L2. The bag is freely widened in the width direction by the length. Nevertheless, the length of the bag in the longitudinal direction may not be increased.

Further, as shown in Fig. 8, portions are formed by overlapping the top ends of the respective side portions of the first sheet body 11 and the second sheet body 12 and fixing the same to each other, so that each is gradually inclined inside and upwardly. The sideways

length L3 corresponding to the open/close portion 19 is set to be slightly longer than the respective length of bottles B1 and B2. That is, even if the bottles are accommodated in the accommodating portions, the lower region of the bag 18 expands in the width direction. Thus, the length of the bag in the longitudinal direction is increased. However, the vicinity of the open/closed portion 19 is not influenced by the accommodation of the bottle or the like, and is not needed to be widened in the width direction. Therefore, the size is not needed to be increased in the longitudinal direction. By forming such configuration of the bag body, the length in the area of the open/close portion 19 and the area of the lower portion of the bag 18 is of little difference, and the length of the whole bag can be limited to the minimum length to accommodate objects to be sterilised. As the result, the sterilising vessel 10 can be formed in a compact size and even when the vessel 10 is placed in a microwave oven or the like, it does not interfere with the peripheral wall portion and can be heated on a turn table.

Further, as shown in Fig. 8, one of the edge portions 'a' of the vessel 10 is provided with a number-of-uses gauge 33. This gauge 33 can be composed of the same material as that of the first and second sheet bodies and includes small pieces 33a, 33b, consisting of a tear-off piece for a unit of the number of uses of the bag. The number of the small pieces 33a, 33b corresponds to number of suggested uses for the life of the sterilising vessel 30. A numeral corresponding to the use-number may be printed on each tear-off piece. Thus, when a user has used the sterilising vessel 30 once, the user tears off a small piece and repeats the process with each subsequent use. A user can then determine the time suitable for preparing another sterilising 30.

Additionally, a temperature-detectable colouring material (not shown) can be applied to the bag along the longitudinal direction.

Such colouring material develops a specific colour with a change of surrounding temperature, for example, thermo-ink and/or the like can be used. This allows the user to look at the temperature distribution in parts of the bag, thereby confirming the treatment time in the microwave over and the safety of handling the bag.

By the above described configuration, the sterilising vessel 30 of the second embodiment has the same effect as the sterilising vessel 10 of the first embodiment, and can also form the bag in a compact size. Further, since the bottles B1 and B2 can be easily loaded and unloaded through an open/close portion 19, and has an accommodating portion S with a wide width, positioning of the bottles is easy in the vessel 30, and the objects to be disinfected can be easily handled.

Fig. 11 and Fig. 12 show a third embodiment of a sterilising vessel of the present invention. Particularly, Fig. 11 is a schematic front view, and Fig. 12 is a schematic perspective view. In these Figs, portions denoted by the same reference numerals as those of the vessel 10 of the first and second embodiments have the same configurations. Overlapped explanations are omitted and the differences between the embodiments will mainly be described below.

In the disinfecting vessel 40, the shape of bag 48 is different from those of the above-mentioned respective embodiments. As shown in Fig. 11, the bag 48 is formed such that the sideways length of the top end of the bag 48 is short. An open/close portion 19 is provided at the position where the sideways length of the top end of the bag body 48 is short. The material of the sheet bodies 41 and 42 forming the bag 48 are the same as that of the respective sheet bodies 11 and 12 shown in Fig. 1. However, the shapes shown in Figs. 11 and 12 are different from those in the first and second

embodiments. A third sheet body having the same shape as that of the third body 13 is used in the third embodiment.

The open/close portion 19 is provided with a zipper type fastener formed by the combination of a convex straight thread provided on the inner surface of the one of the sheet bodies 41 and 42 and a groove provided in the inner surface of the other facing the inner surface, the convex straight thread being tightly fitted into the groove.

In an upper region above open-close portion 19 of the bag 48, a portion FP corresponding to a portion having a height h1 in Fig. 11 is formed as a grasping portion. This grasping portion FP is formed integrally with each of the sheet bodies 41 and 42 and has the following functions. When the sterilising vessel 40 contains water heated in a microwave oven, no water vapour reaches the portion above the open/close portion 19. Thus, since the grasping portion FP is formed by leaving the portion h1, which can be grasped with thumb and fingers, handling of the sterilising vessel 40 becomes safer. Thus, to handle the vessel 40 with safety, the grasping portion FP shows a portion to be grasped, which a user can visually find easily. As a result, the safety of the user handling the bag is enhanced.

In sterilising vessel 40, an internal pressure control means 21 shown in Fig. 11 is provided at an edge portion positioned on the upper portion of the bag 48 and just below the open/close portion 19. The structure of this internal pressure control means 21 is similar to that shown in Fig. 4. On the other hand, a locking portion 22 is provided at the lower edge portion on the opposite side to this internal pressure control means 21. This locking portion 22 is formed by overlapping holes 22b provided on folding portion of the second sheet body 42 (refer to the description of Fig. 1) and on the

corner of the third sheet body 13, respectively, and inserting a locking ring 22a into the hole 22b. Therefore, the locking means 22 has the same configuration as that of the first and second embodiments except that the means-forming position is an edge portion on the opposite side to the internal pressure control means 21.

The sterilising vessel 40 has the above-explained configuration and has the same effects as the vessels of the first and second embodiments, and can be used in the same manner. Additionally, the sterilising vessel 40 has the following functions. In Fig. 11, a region where the bag body laterally protrudes is formed. That is, the accommodating portion S1 is provided to have a portion longer than the upper or top portion of the bag body 48 by the protruded length W1 in Fig. 11.

Although this accommodating portion S1 has length necessary to accommodate objects to be disinfected, such as baby bottles and the like, as will be later described, the upper region of the bag 48 corresponding to the open/close portion 19 is formed to have a length shorter than such length. That is, when the objects to be sterilised are placed into the accommodating portion S1, they are placed with the portion S1 being inclined and each length direction of the respective objects is matched with the length direction of the accommodating portion S1. Loading and unloading the objects to be sterilised can be performed in the same manner as cases of the first and second embodiments.

On the other hand, the open/close portion 19 becomes short by a length which the upper portion of the bag 48 was relatively shortened. Thus, on marketing the sterilising vessel 40, the vessel can be folded along the dotted line ML. If the shape of the vessel has a shape of the first or second embodiment, folding of the

product is performed in the middle of the long open/close portion. However, if the open/close portion 19 is composed of a zipper type openable fastener or the like, folding of the product in the middle may cause damage to the same. When the vessel 40 of the third embodiment is folded, the open/close portion 19 is not folded. As a result, according to the third embodiment, the vessel 40 can be transported and stored in a compact size without damaging the functions of the open/close portion 19.

Fig. 12 shows a state where baby bottles B1 and B2 are accommodated in the sterilising vessel 40, the orientation of the vessel is reversed from left to right. However, the structure of the vessel 40 in Fig. 12 is the same as that in Fig. 11. Referring to Fig. 12, when bottles B1 and B2 are to be sterilised, they are accommodated into the accommodating portion S1 with the opening of each bottle being turned to the internal pressure control means 21 as shown in Fig. 12. Thus, after sterilisation, the vessel 40 is removed from the microwave oven whilst grasping the grasping portion FP. Then when locking means 22 is locked in the same manner as shown in Fig. 5, water left in the bag body 48 and bottles can be discharged from the through aperture of the internal pressure control means 21 to the external environment.

This invention is not limited to the above-described embodiments. The bag for the sterilising vessel 40 may be composed of not only three sheets but also a plurality of sheets obtained by separating the three sheets respectively. Further, a number-of-uses gauge and colouring for temperature indication can be applied to the vessel of the first embodiment. Further, a grasping portion can be formed on the upper portion of the bag in the first and second embodiments. The open/close portion can use various configurations different from the above-described open/close portions. Furthermore, the locking portion can be composed of an

aperture only. Additionally, the present invention can be applied to cases where a gusset portion 31 as shown in Fig. 10 is formed on the vessel 40 of the third embodiment.

As described above, according to the present invention, a safe and excellent-usability sterilising vessel can be provided, in which even if the vessel is removed immediately after heat treatment in a microwave oven, the possibility of a user suffering a burn is reduced.

Claims

1. A sterilising bag, said bag formed from flexible sheet material and wherein said bag has a first opening which is selectively sealable and through which an article or articles to be sterilised are placed into the bag, and at least a second exhaust opening which remains open during the sterilisation process.

2. A sterilising bag according to claim 1 wherein the first opening is sealed and resealed using a zip formation, adhesive patches and/or the like.

3. A sterilising bag according to claim 1 wherein said bag includes a portion which is upstanding when the bag is in use to allow the bag to be gripped by the user.

4. A sterilising bag according to claim 1 wherein the bag is made from material which allows the bag to be reused a number of times.

5. A sterilising bag according to claim 4 wherein the sheet material can include any or any combination of nylon, polyethylene terephthalate (PET), polypropylene and/or the like.

6. A sterilising bag according to claim 5 wherein a laminate material is used and comprises an outer layer of PET and an inner layer of CPP.

7. A sterilising bag according to claim 1 wherein the bag is provided with printed matter thereon which includes any or any combination of instructions, a means of indicating the

number of occasions of use of the bag, the manner in which the articles should be placed in the bag and/or means indicating various features of the bag.

8. A sterilising bag according to claim 7 wherein a number of uses gauge is provided and comprises a plurality of tear off strips equal to the number of uses of the life of the bag.

9. A sterilising bag according to claim 8 wherein a temperature detectable colouring material can be applied to the bag to indicate the temperature in a particular area of the bag.

10. A sterilising bag according to claim 1 wherein said bag is formed from at least first, second and third sheets of material comprising a base portion and front and rear walls, joined together along their respective peripheral edges.

11. A sterilising bag according to claim 10 wherein the sheets of material are joined along their edges by heat sealing.

12. A sterilising bag according to claim 11 wherein the base forms part of the side walls of the bag when articles are contained therein.

13. A sterilising bag according to claim 1 wherein the bag is free standing.

14. A sterilising bag according to claim 1 wherein the exhaust opening comprises a recessed portion on an external peripheral edge of the bag and an aperture passing from the peripheral edge between the exterior of the bag to the interior of the bag.

15. A sterilising bag according to claim 14 wherein the diameter of the aperture increases from the exterior of the bag to the interior of the bag.

16. A sterilising bag according to claim 14 wherein the recessed portion of the bag narrows inwardly from the external peripheral edge of the bag towards the interior of the bag.

17. A sterilising bag according to claim 1 wherein when the internal bag pressure is low the exhaust opening is closed and when the internal bag pressure is increased during heating the exhaust opening is open.

18. A sterilising bag according to claim 17 wherein when an article or articles are located in the bag, the exhaust opening is open.

19. A sterilising bag according to claim 1 wherein the exhaust opening is located below the position of the first opening.

20. A sterilising bag according to claim 1 wherein two exhaust openings are provided on the bag, one opening on each side of the bag.

21. A sterilising bag according to claim 1 wherein attachment means are provided on the bag by which the bag can be hung.

22. A sterilising bag according to claim 21 wherein the attachment means is provided on a corner of the bag opposite the at least one exhaust opening.

23. A sterilising bag according to claim 21 wherein the attachment means includes an aperture.

24. A sterilising bag according to claim 23 wherein a hook can be located through the aperture by which the bag can be hung to discharge water and/or vapour.

25. A sterilising bag according to claim 10 wherein the peripheral edges of the base in use are raised to form a gusset portion provided at each side of the bag.

26. A sterilising bag according to claim 10 wherein the length of the base of the bag is greater than the length of the first opening.

27. A sterilising bag according to claim 1 wherein the article(s) for sterilisation are babies bottles and are accommodated in the bag sideways, the longitudinal length of the bottle(s) adjacent a base of the bag.

28. A method of using a sterilising bag according to claim 1 wherein water is placed into the bag along with the article or articles to be sterilised, whereupon the first opening is sealed.

29. A method of using a sterilising bag according to claim 1 wherein the sterilisation process is performed by placing the bag containing the article(s) in a microwave oven on a heat operation for a pre-determined period of time.

30. A method of using a sterilising bag according to claim 28 wherein once the sterilisation process is complete, water and/or water vapour is discharged from the bag via the second

exhaust opening and the first opening is then opened to allow removal of the article(s).

31. A method of using a sterilising bag, said bag formed from flexible material, said method including the steps of placing an article or articles to be sterilised into the bag through a first opening which is selectively sealable, placing water into the bag along with the article or articles, heating the bag for a pre-determined period of time and wherein water and/or water vapour is discharged from the bag via a second exhaust opening.

32. A sterilising bag substantially as hereinbefore described with reference to Figures 1-12.

Application No: GB 0029814.1 **Examiner:** Brendan Donohoe
Claims searched: All **Date of search:** 9 May 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): B8K (KFD, KX, KXX)

Int Cl (Ed.7): B65D 33/01, 77/22, 81/34.

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X, Y	GB 2237553 A	(HUNT) - See figure 3, page 4 line 29 - page 5 line 2, and page 5 line 23 - page 6 line 10.	X: 1, 2, 4, 5, 13, 17, 19 &20 Y: 14 &16
X, Y	EP 0983943 A2	(TILMAN) - See col. 1 lines 31-34, col. 3 lines 32-38, col. 4 lines 32-36, col. 7 lines 6-15, and col. 8 lines 1-4.	X: 1, 2, 4, 5, 13 &19 Y: 14 &16
X, Y	EP 0198362 A2	(GOURMEC) - See figure 1a, col. 8 lines 32-34 & 52-56, col. 12 lines 12-13, and col. 21 lines 22-28.	X: 1, 4-6, 13, 17, 19, 20 &28-31 Y: 7, 14 &16
X, Y	US 4797010	(COELHO) - See figure 1, col. 5 line 22, and col. 8 lines 12-16 & 24-25.	X: 1-5, 13, 19-21 &28-31 Y: 7, 14 &16
Y	US 4177620	(DALY) - See figure 1.	7
Y	US 3502487	(BYRD) - See figures 1, 3 & 5.	14 &16

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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